

Better Buildings Residential Network Peer Exchange Call Series:

Tackling Workforce Shortages in the Residential Energy Field

October 10, 2019



Agenda and Ground Rules

- Agenda Review and Ground Rules
- Opening Poll
- Residential Network Overview and Upcoming Call Schedule
- Featured Speakers:
 - David Foster, Energy Futures Initiative
 - Sara Zak, Build It Green
 - Jason Dispenza, EDGE Energy
- Open Discussion
- Closing Poll and Announcements

Ground Rules:

- 1. Sales of services and commercial messages are not appropriate during Peer Exchange Calls.
- 2. Calls are a safe place for discussion; **please do not** attribute information to individuals on the call.

The views expressed by speakers are their own, and do not reflect those of the Dept. of Energy.





Better Buildings Residential Network

Join the Network

Member Benefits:

- Recognition in media and publications
- Speaking opportunities
- Updates on latest trends
- Voluntary member initiatives
- One-on-One brainstorming conversations

Commitment:

Members only need to provide one number: their organization's number of residential energy upgrades per year, or equivalent.

<u>Upcoming Calls (2nd & 4th Thursdays):</u>

- Oct 24: Health and Energy Efficiency Are Trending
- Nov 14: Window Treatments The Undervalued Highly Efficient Energy Efficiency Measure
- Dec 12: Electrification What Does It Mean for Energy Efficiency?

Peer Exchange Call summaries are posted on the Better Buildings website a few weeks after the call For more information or to join, for no cost, email bbresidentialnetwork@ee.doe.gov, or go to energy.gov/eere/bbrn & click Join





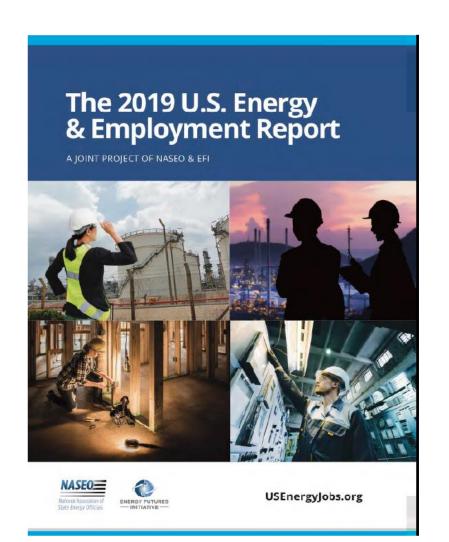


David Foster Energy Futures Initiative





2019 U.S. Energy and Employment Report



Energy Efficiency Jobs in America

"The Green Workforce Shortage"

October 10, 2019

--David Foster, Distinguished Associate,

Energy Futures Initiative and Chief Author USEER



Overview—2019 USEER

- The USEER is based on an annual supplemental employer survey, integrated with the BLS Quarterly Census on Employment and Wages.
- It studies employment in the following sectors:
 - Fuels
 - Electric Power Generation (EPG)
 - Transmission, Distribution, and Storage (TDS)
 - Energy Efficiency (EE)
 - Motor Vehicles
- Fuels, EPG, and TDS make up the Traditional Energy Sector.



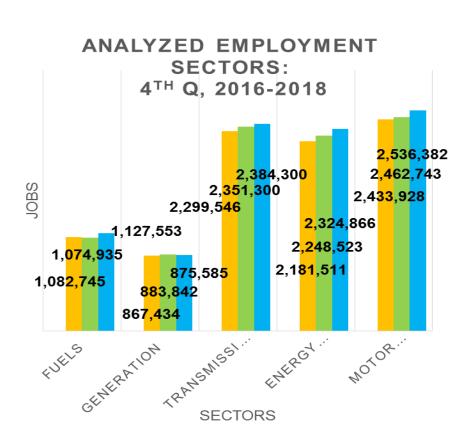
USEER Content

•The survey covers direct employment in 53 different energy, energy efficiency and motor vehicle technologies across 186 NAICS codes located in seven broad industrial classifications.

- •The survey determines:
 - Employment numbers
 - Employer hiring expectations for the next 12 months
 - Hiring difficulty by technology and industrial classification
 - High demand jobs and skills gaps
 - Workforce demographics by race, ethnicity, gender, and veteran's status
 - Geographic location by state, county, congressional and legislative districts, and MSA of each technology and industrial classifications



2019 Key Takeaways



226,000 New Jobs in **2018** in **5** Sectors

- Traditional Energy and Energy Efficiency added 152,000 jobs in 2018, out performing the economy for the 4th year in a row by 0.5 percentage point, 2.3% to 1.8%.
- Fuels production added 52,000 new jobs, 33,000 in oil and 17,000 in natural gas, while coal mining held firm.
- Generation declined by 8,000 jobs with coal, solar, and nuclear declining, partially offset by natural gas, wind, CHP, and geothermal
- TDS added 33,000 new jobs, concentrated in utility projects and storage.
- Energy efficiency added 76,000 jobs; 275,000 in last 3 years
- Motor vehicles added 74,000 jobs, while alternative fuel vehicles bounced back, adding almost 34,000 jobs.



USEER Definition of Energy Efficiency Jobs

- "Energy Efficiency employment covers both the production and installation of energy-saving products and the provision of services that reduce end-use energy consumption. These jobs, as specified in the current survey, include the manufacture of ENERGY STAR®-labeled products, as well as building design and contracting services that provide insulation, improve natural lighting, and reduce overall energy consumption across homes and businesses."
- Does not include energy efficiency employment in manufacturing processes.
- Includes CHP and waste heat to power, but in EPG numbers.



USEER Energy Efficiency Technologies

- Energy Star appliances
- LED, CFL, and other efficient lighting
- Traditional HVAC
- Energy Star/high efficiency HVAC
- Renewable heating and cooling, including solar thermal
- Advanced building materials/insulation
- Recycled building materials
- Reduced water consumption products/appliances
- Other



"Other" Energy Efficiency Technologies

- Variable speed pumps
- Other design services not specific to a subtechnology
- Software not specific to a subtechnology
- Energy auditing, rating, monitoring, metering and leak detection
- EE Policy not specific to a subtechnology
- LEED certification
- Consulting not specific to a subtechnology
- Phase-changing materials



Energy Efficiency Jobs by Technology & Industry--2018

Table 44.

Energy Efficiency Sector – Employment by Detailed Technology
Application and Industry, Q2 2018

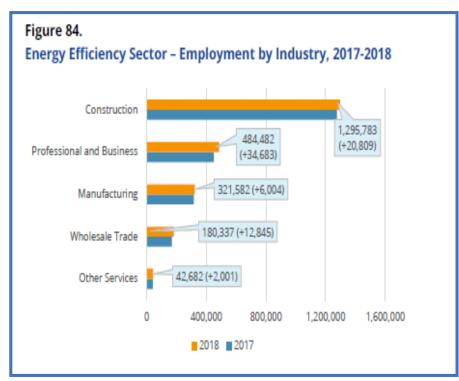
	Total	Construction	Manu- facturing	Wholesale Trade	Professional Services	Other Services
ENERGY STAR Appliances	167,828	86,547	17,350	12,852	46,671	4,408
LED, CFL and Other Efficient Lighting	370,562	184,471	49,408	39,266	93,901	3,517
Traditional HVAC goods, control systems, and services	582,108	322,181	33,023	54,354	156,326	16,224
ENERGY STAR/ High Efficiency heating and cooling equipment	427,503	275,285	74,791	26,362	46,421	4,644
Renewable Heating and Cooling (including Solar Thermal)	128,896	82,513	7,823	7,865	29,909	785
Advanced Building Materials/Insulation	357,765	204,245	74,377	22,462	54,297	2,384
Recycled building materials	82,423	46,921	11,844	2,801	17,849	3,007
Reduced water consumption products and appliances	91,555	58,069	6,109	5,291	20,728	1,358
Other	116,225	35,550	46,856	9,086	18,379	6,354
TOTAL	2,324,865	1,295,782	321,581	180,339	484,481	42,681

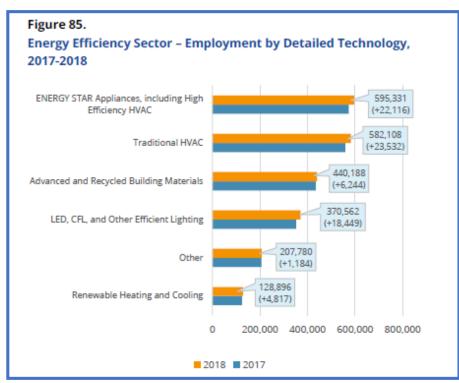
Overview

- Construction is the largest industry sector of EE at 55.7%.
- Professional Services is second at 20.8%.
- Manufacturing is third at 13.8%
- The largest technology is Traditional HVAC at 25.0%
- EnergyStar/High efficiency HVAC is second at 18.4%.
- •LED, CFL, and other efficient lighting is third at 15.9%.



Year-over-Year Growth in Energy Efficiency

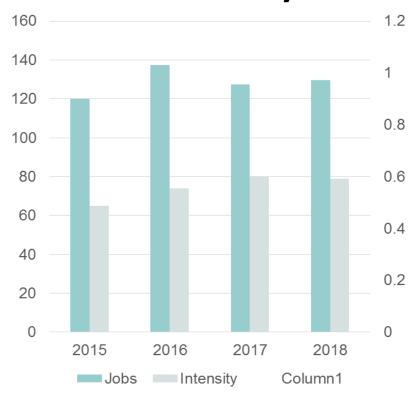






Energy Efficiency Intensity and Job Growth in Construction

Growth in Intensity & #'s



Key Observations

- •The demand for labor is both in volume and intensity.
- In 2016, intensity increased by 6.8%, while numbers declined by 100,000.
 However the intensity resulted in a higher demand for EE construction workers.



Energy Efficiency Employment— Top States

State	EE Jobs
	Overall
CA	318,542
TX	162,816
NY	123,292
FL	118,412
IL	89,469
NC	86,559
MA	86,473
MI	85,061
ОН	81,676
VA	78,670
MD	70,530
PA	68,820
WA	63,877
WI	63,141
GA	61,193

State	Efficient
	Lighting
CA	71,893
TX	59,650
NC	42,893
NY	36,848
FL	32,499
WI	26,054
VA	20,733
ОН	16,290
WA	16,222
MI	14,775
MA	14,494
PA	14,286
IL	13,311
MN	12,445
MD	11,748

State	EE
	Manufacturing
MI	44,057
CA	33,502
WI	21,691
IL	19,903
ОН	17,221
TX	15,894
NC	14,391
IN	13,579
PA	13,396
TN	12,239
KY	10,314
GA	8,166
МО	7,839
AL	7,726
MA	7,521



Demographics of EE Workforce

Table 49. Energy Efficiency Sector – Demographics, Q4 2018

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	1,767,865	76%	53%
Female	557,000	24%	47%
Hispanic or Latino	365,427	16%	17%
Not Hispanic or Latino	1,959,438	84%	83%
American Indian or Alaska Native	32,553	1%	1%
Asian	120,540	5%	6%
Black or African American	175,914	8%	12%
Native Hawaiian or other Pacific Islander	26,716	1%	>1%
White	1,811,682	78%	78%
Two or more races	157,460	7%	2%
Veterans	235,384	10%	6%
55 and over	327,072	14%	23%
Union	251,785	11%	11%

- Key Takeaways, the EE
 Workforce is—
 - 3 to 1 male;
 - Racially diverse; however, A-A's are less represented;
 - Veterans are more represented;
 - Older workers less represented;
 - Almost twice the private sector unionization rate of 6.4% at 11%.



Wage Variation across Energy and Energy Efficiency Industry Sectors

	Construction	Professional Services	Manufacturing	Utilities	Mining and Extraction	Wholesale Trade
Number of EE's	1,867,000	956,000	762,000	603,000	528,000	624,000
Entry level	\$14.77	\$22.10	\$16.75	\$25.06	\$16.68	\$21.83
Median level	\$21.82	\$33.44	\$26.63	\$36.61	\$26.56	\$33.35
Highest level	\$34.60	\$52.62	\$44.38	\$55.43	\$40.87	\$51.64

Key Findings:

- Wage correlation is closest to industry sector as opposed to energy technology.
- Utilities, at all levels, provide the highest median wage.
- Over 50% of these sectors have median entry level wages below \$17/hr.
- Largest % increases from entry level to median are in mining and manufacturing at 59%.



Energy Efficiency Jobs Generally Pay a Premium, but Location & Unions Count.

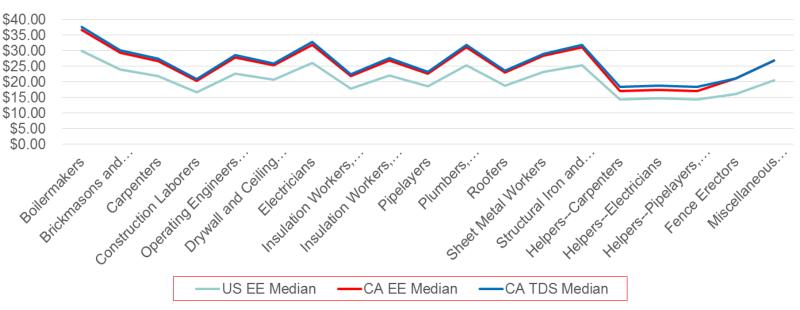
Description	S. Median LS Hourly Earnings	EE	. Median Hourly arnings	Premium iscount	Calif	ornia EE	Premium r Discount
Boilermakers	\$ 29.93	\$	30.83	\$ 0.90	\$	36.65	\$ 6.72
Brickmasons and Blockmasons	\$ 23.93	\$	24.65	\$ 0.72	\$	29.31	\$ 5.38
Carpenters	\$ 21.71	\$	22.36	\$ 0.65	\$	26.59	\$ 4.88
Construction Laborers	\$ 16.60	\$	17.10	\$ 0.50	\$	20.33	\$ 3.73
Operating Engineers and Others	\$ 22.61	\$	23.29	\$ 0.68	\$	27.69	\$ 5.08
Electricians	\$ 26.01	\$	26.79	\$ 0.78	\$	31.85	\$ 5.84
Insulation Workers, Floor, Ceiling, and Wall	\$ 17.81	\$	18.34	\$ 0.53	\$	21.81	\$ 4.00
Insulation Workers, Mechanical	\$ 21.90	\$	22.56	\$ 0.66	\$	26.82	\$ 4.92
Plumbers and Pipefitters	\$ 25.28	\$	26.04	\$ 0.76	\$	30.96	\$ 5.68
Roofers	\$ 18.74	\$	19.30	\$ 0.56	\$	22.95	\$ 4.21
Sheet Metal Workers	\$ 23.07	\$	23.76	\$ 0.69	\$	28.25	\$ 5.18
Structural Iron and Steel Workers	\$ 25.30	\$	26.06	\$ 0.76	\$	30.98	\$ 5.68



EE Construction Workers' Wagesin CA

There is a clear locational wage premium for EE construction workers in CA, but no skills' premium. TDS construction workers make from \$.60-\$1.50/hr. more than EE construction workers.







Hardest EE Construction Jobs to Fill

- 1. Technician or mechanical support (42%)
- 2. Electricians (41%)
- 3. Installation workers (27%)

By comparison in EE Manufacturing, the hardest jobs to fill were:

- 1. Sales, marketing, or customer service (24%)
- 2. Technician or mechanical support (21%)
- 3. Engineers, scientists (21%)



EE Construction Employer Reasons for Hiring Difficulty

- 1. Lack of experience, training, or technical skills (48%)
- 2. Competition/small applicant pool (24%)
- 3. Insufficient non-technical skills (24%)

By comparison, EE manufacturing employers cited:

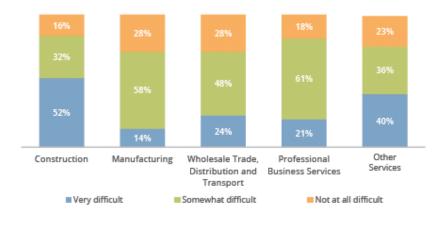
- 1. Lack of experience, training, or technical skills (55%)
- 2. Insufficient non-technical skills (39%)
- 3. Difficulty in finding industry-specific knowledge, skills, and interest (18%)



2018 Hiring Difficulty in Energy Efficiency

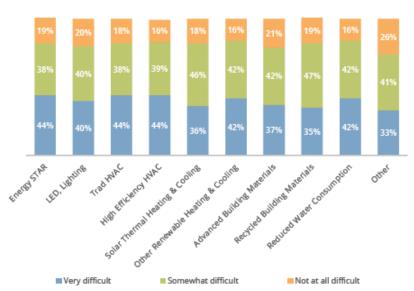
By Industry

Figure 90.
Energy Efficiency Sector – Hiring Difficulty by Industry, Q4 2018



By Technology

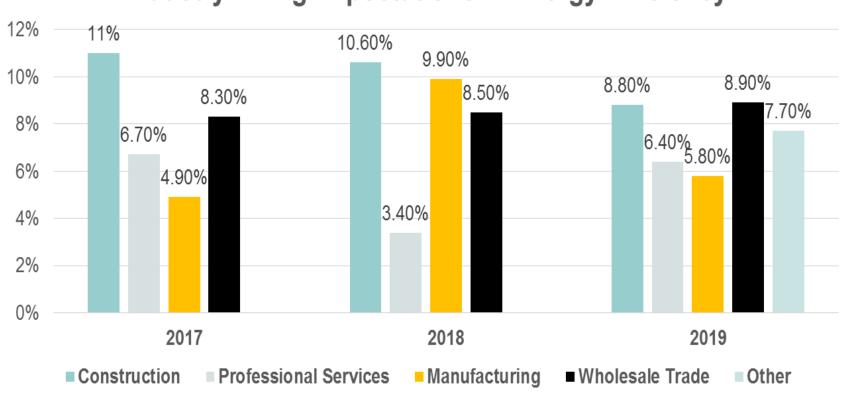
Figure 91.
Energy Efficiency Sector – Hiring Difficulty by Technology, Q4 2018





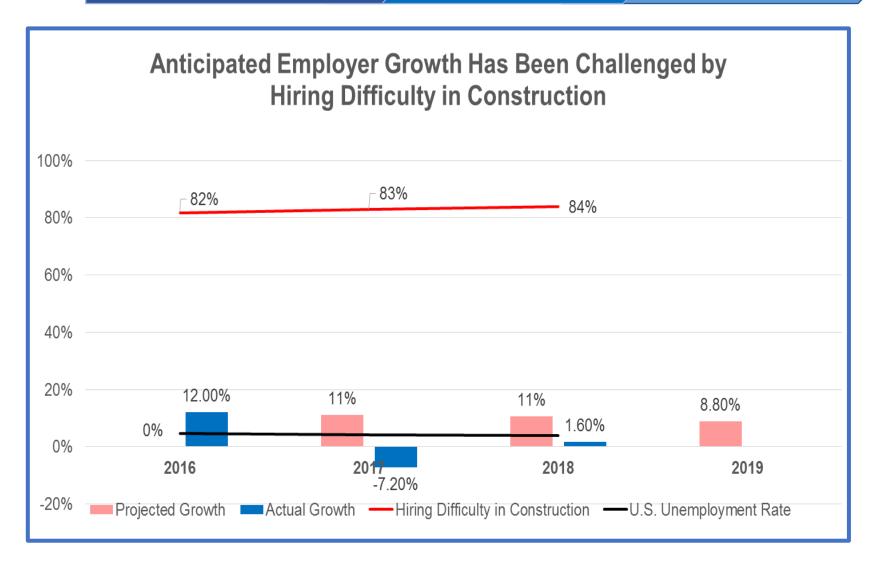
2017-19 Energy Efficiency Hiring, Expectations by Industry Sector

Industry Hiring Expectations in Energy Efficiency





Projected EE Construction Job Growth vs. Actual





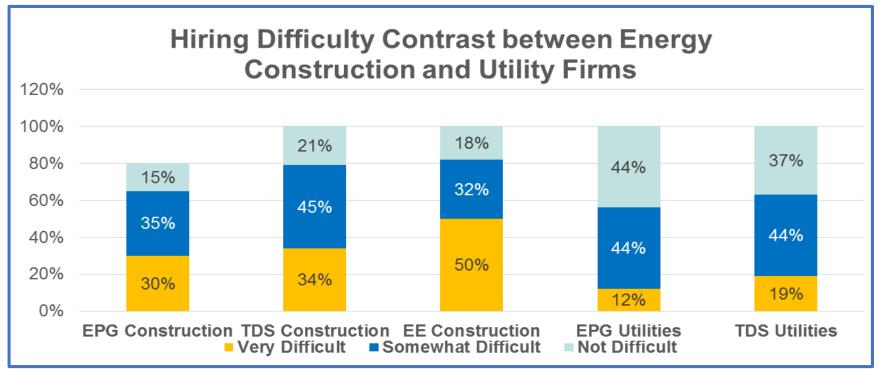
National Hiring Crisis in Clean Energy— Overall Hiring Difficulty of 77%.

Technology	2017 Projected Hiring	2018 Actual Hiring	2018 Hiring Difficulty	2019 Projected Hiring
Energy Efficiency (overall)	9.0%	3.4	81%	7.8
Energy Efficiency Construction	10.6%	1.6%	84% (52%)	8.8%
Energy Efficiency Professional	3.4%	7.7%	82% (21%)	6.4%
Energy Efficiency Manufacturing	9.9%	1.9%	72%	5.8%
Wind Construction	3.7% (overall)	3.5% (overall)	86% (28%)	6.2%
Solar Construction	5.0% (overall)	(.03.2)% (overall)	85%	8.6%
Battery Storage	NA	18.1%	92% (23%)	4.4%
Grid Modernization		3.3%	80% (17%)	1.9-2.3%
TDS Construction	5.4%	4.8%	79% (34%)	4.0%
TDS Utilities	(.6)%	1.7%	56% (12%)	1.1



But Some Employers Do Better

•76.9% of all surveyed employers reported difficulty hiring qualified workers over the last 12 months; 29% noted it was very difficult. (In 2017, these numbers were 70% and 26%).





Elements of Success in the Utility Sector

- •Energy utility sector recognized a retirement bubble was coming in 2006.
- •Formed Center for Energy Workforce Development, a multi-utility, multi-state endeavor to:
 - Work with their unions.
 - Upgrade apprenticeship programs.
 - Form partnerships with local workforce centers, community colleges, local utilities, and states.
 - Recruit exiting military servicemen with special boot camps.
 - Built career pathways in energy models.
 - Developed special curricula.
 - •Supported diversity networks such as Blacks in Energy, Women in Energy, and Veterans in Energy.

ENERGY FUTURES — INITIATIVE —

2019 USEER

Thank you!

Questions?

To download the 2019 USEER or state fact sheets, go to www.usenergyjobs.org
For more information, contact:

- David Foster at <u>dafoster@energyfuturesinitiative.org</u>
- Sandy Fazeli at sfazeli@naseo.org
- David Ellis at <u>ddellis@energyfuturesinitiative.org</u>



Sara Zak Build It Green



Why Good Contractors Are Hard to Find

Tackling Workforce Shortages in the Residential Energy Field

Sara Zak

Contractor Engagement – Build It Green (Franklin Energy)
contractorengagement@builditgreen.org

My Background

- Customer Service ("Home Performance Advisor")
 - Educated customers on program rules/expectations, whole-house approach
- Program Implementation
 - Incentive payouts
 - Program reporting
- Contractor Support
 - Energy Upgrade California
 - AC Quality Care
 - Low Income Weatherization Program
 - Pay for Performance
 - Companies range from 1 employee to 50!





Why Good Contractors Are So Important

- Successful program contractors:
 - They promote programs
 - They educate customers
 - They get the work done
 - They generate project volume
- Contract delivery
 - Meeting goals=being able to bid on future contracts
- Market Transformation
 - Quality work = example of positive reinforcement to customers on investment





Why Good Contractors Are Hard To Find

- Good contracting company owners are hard to find
 - Not all owners have energy efficiency as a priority
 - Willingness to take responsibility / learn new things
- Company culture is key
 - Not all companies believe in transparency, staff advancement, or fair pay
- Transparent and supportive owners mean:
 - Greater motivation from employees to do good work
 - Staff feel comfortable coming forward when processes don't work
 - Limits staff turnover: more likely to stay at a supportive company with opportunities for growth





From My Perspective: Working With Contractors

What doesn't work: contractor → customer

- Sales team disconnect: overpromising, under delivering
- Skipping educational opportunities
 - Importance of Building Science
 - Health & Safety
- Missed opportunities in the home
 - Incomplete/rushed assessments
 - Not listening to customer's needs

What does work: contractor → customer

- Under-promising, over delivering
- Taking the time to educate customers
 - Leave behind materials important
 - Being responsive
- Comprehensive assessmen educating customer

on the results

- Fewer call backs
- More customer referrals



Working With Contractors

What does work: implementer → contractor

- If possible: vet the company
 - Yelp, Angie's List, etc.
 - Subcontractors & Vendors
 - State licensing authority
- Make Participation Expectations Clear
 - In-person check-ins
 - Phone check-ins
 - 48 hour customer complaint resolution expectation
 - Installation Specifications



- Provide helpful resources
 - Job submission checklist (contractor internal process)
 - Clear understanding on submission requirements / admin time

Agreement

- Customer facing marketing materials
- Quarterly webinars
- Trainings / Mentoring
 - Free PG&E trainings

From My Perspective: Working With Contractors Making a "Bad" contractor "Good" – Sample Case Study

- Eastern SF Bay Area to central valley of CA
 - AC Quality Care
 - · Approx. 40 employees
 - 1,700+ Applications per year
- · Identify reasons for failures
- Mandatory trainings/field mentoring sessions
 - · Learn about their work-flow
 - Identify opportunities for improvement
 - Highlight importance of closeout checklists
 - · Data quality
 - Costs more to retrain staff!
 - · Hidden costs of go-backs
- They are willing to receive feedback and improve processes
- Keep the owner engaged and in the-the-loop!







When working to find "Good" contractors, engaging with contractors, or when "Making Bad Contractors Good":

- Giving contractors benefit of the doubt
 - Engage them in plan and goals for improvement
 - Follow-up on plan/goals
- Treating them like Partners
 - Without them we don't have a Program!
 - It's a small industry, lets work together!









Jason Dispenza EDGE Energy









13 years at:



5 years of:

Economic Research for Non-Profits





3 years at:





Jason Dispenza, ceo jason.dispenza@enledgerio 705-220-5868 mobile www.enledger.io

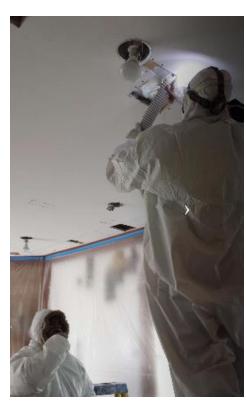
Good Contractors =

Start of a Solution Pyramid













Thank You

SAFETY

PERFORMANCE

INTEGRITY

Jason Dispenza

President

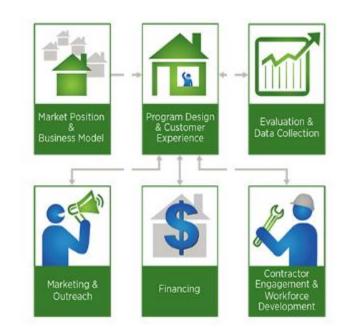
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Explore the Residential Program Solution Center

Resources to help improve your program and reach energy efficiency targets:

- Handbooks explain why and how to implement specific stages of a program.
- Quick Answers provide answers and resources for common questions.
- Proven Practices posts include lessons learned, examples, and helpful tips from successful programs.
- Technology Solutions NEW! present resources on advanced technologies, HVAC & Heat Pump Water Heaters, including installation guidance, marketing strategies, & potential savings.



https://rpsc.energy.gov





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